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|---|---|
| PADMANABHAN, KARTIC | |
| ART UNIT | PAPER NUMBER |
| 1641 | |

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/929,293 | DENNY ET AL. | |
| | Examiner | Art Unit | |
| | Kartic Padmanabhan | 1641 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-11 and 13-79* is/are pending in the application.

4a) Of the above claim(s) *2,4,5,8,9,23-71,73,75 and 76* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6,7,10,11,13-22,72,74 and 77-79* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-11 and 13-79* are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *8/14/01* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Newly submitted claims 75-76 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 75-76 require the step of isolating a mucin from all other sialic-acid containing molecules, which is not present in the originally elected claims. Claim 23 also becomes non-elected, as applicant has changed its dependency to depend on the newly submitted group. Since claims 30, 31, and 73 depend either directly or indirectly from claim 23, these claims are also now non-elected.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 23, 30, 31, 73 and 75-76 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. It is also noted that claims 2, 4-5, 8-9, 24-29, and 32-71 remain withdrawn from consideration as being directed to non-elected invention for reasons of record (see Paper #3 and Paper #11).

2. This application contains claims 2, 4-5, 8-9, 23-71, 73, and 75-76 drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 7, 14-19, and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Nielsen et al. (J Dental Res., 1996). The reference discloses the detection of a component of MUC7 (MG2) in salivary samples. Specifically, monoclonal antibodies Mab PANH3 against a synthetic peptide derived from MUC7 were used to stain concentrated saliva samples in western blot analysis. The antibody probes were taught to be useful in studying mucin expression in diseases of the salivary gland (See abstract). Isolation of mucin was conducted using SDS-Page and western blot analysis (Page 1822).

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 3, 6, and 77-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nielsen et al. (1996) in view of Belce et al. (Tohuku J Exp Med, 2000).

Nielsen et al. teach a detection method as discussed above under 35 USC 102 (b). However, the reference does not teach measurement of sialic acid or unstimulated saliva.

Belce et al. teach the measurement of sialic acid in unstimulated saliva specimens. Decreased levels of salivary sialic acid may be a possible factor leading to oral complications of diabetes mellitus (abstract).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to incorporate the measurement of sialic acid in unstimulated saliva samples as taught by Belce et al. in the salivary based mucin assessment method for disease of Nielsen et al. because Belce et al. teaches that sialic acid levels in unstimulated saliva was important in evaluating complications/disease such as diabetes mellitus. Therefore, there would have been sufficient motivation to detect sialic acid levels in unstimulated saliva to determine disease state in a subject.

10. Claims 10-11, 13, 20-22, and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nielsen et al. (1996) in view of Belce et al. (2000) as applied to claims, 6, and 77-79 above, and further in view of Astor et al. (Ear, Nose, & Throat J, 1999).

Nielsen et al. and Belce et al. teach a modified detection, as discussed above. However, the references do not teach the evaluation of male and female subjects between the ages of 18 and 35 for dental caries risk assessment.

Astor et al. teach methods of assessing patients at risk for dental caries. Xerostomia or dry mouth was evaluated in male and female patients. Saliva content and compositions were assessed for this condition. It was determined that aging causes changes in the composition and mixture of saliva, with primarily a decrease in ptyalin and increase in mucin (page 477, Col. 1). Although Xerostomia is usually associated with the elderly, it can also occur with depression, mucositis, oral infections, dental infections, dysphasia, speech disorders, and digestive problems (page 476). Patients were at risk for developing Xerostomia as a systemic disease or when they were undergoing drug or radiation therapy (page 477). The early detection of Xerostomia is taught to be useful in treatment and prevention of complications (page 476).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to evaluate Xerostomia in saliva by determining mucin and ptyalin levels of patients of any age as a means to assess/treat/prevent disease as taught by Astor et al. in the modified detection method of Nielsen et al. and Belce et al. because Astor et al. teach that salivary physiology is significant in evaluating patient disorders. Further, the function of saliva is diverse and critical, and mucin secretion is a part of that criticality (Astor, page 476). Therefore, one of ordinary skill in the art at the time of the invention would have been motivated

to assess mucin levels in human saliva as a measure of disease/disorder in order to detect potential problems and possibly prevent their spread. In addition, it would have been obvious to select any units of measure one desired to report mucin levels. The combination of Nielsen et al., Belce et al., and Astor et al. teach the claimed invention except for the teaching of units per millimeter saliva as the measurement parameter. It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to utilize units per millimeter saliva as the measurement parameter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***Response to Arguments***

11. Applicant's arguments filed 12/1/03 have been fully considered but they are not persuasive.

12. Applicant first argues that Nielsen et al. fail to disclose or teach any of the specific diseases listed in newly amended claim 1 (and new claim 77), to which the examiner acquiesces. However, the examiner maintains that the diseases listed as part of the "wherein" clause do not further limit the claimed method. "A 'whereby" clause that merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim." Texas Instruments, Inc. v. International Trade Comm., 988 F.2d 1165, 1171, 26 USPQ2d 1018, 1023 (Fed. Cir. 1993). See also Minton v. National Assoc. of Securities Dealers, Inc., 336 F.3d 1373, 1381, 67 USPQ2d 1614, 1620 (Fed. Cir. 2003)("A whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited.") Even though the present claims use "wherein", rather than "whereby", this is a distinction

without difference, and are corresponding treated the same. The positively recited process steps in the claims provide a result showing the presence a component associated with mucin. The "wherein" clause does not change anything about the recited steps but simply states a characterization of the results of those steps; i.e. diagnosis or prediction of certain specific diseases. Cf. Minton, 336 F.3d at 1381, 67 USPQ2d at 1620-1621 ("The term 'efficiently' [in the whereby clause] on its face does not inform the mechanics of how the trade is executed....Rather, the term 'efficiently' is a laudatory one characterizing the result of the executing step."). Similarly here, the "wherein" clause does not inform the mechanics of how the steps are performed, but merely characterizes the results of those steps. As such, the "wherein" clause is not entitled to patentable weight in construing the claims.

13. Applicant goes on to argue that the Nielsen reference is improperly applied, as the present invention provides unexpected results; however, unexpected results are only relevant to the determination of patentability under 35 USC 103 and have no place in an analysis under 35 USC 102(b), under which provision Nielsen was applied.

14. In response to applicant's argument that Nielsen does not teach a correlation between a concentration of a component associated with a mucin a oral disease, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). If the "body of the claim fully and intrinsically sets forth the

complete invention, including all of its limitations, and the preamble offers no distinct definition of any of the claimed invention's limitations, but rather merely states, for example, the purpose or intended use of the invention, then the preamble is of no significance to claim construction because it cannot be said to constitute or explain a claim limitation." Pitney Bowes, Inc. v. Hewlett Packard Co., 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999).

15. Applicant's arguments that Belce does not teach correlation with the specific disease listed in the claims are unconvincing for reasons as discussed above with respect to Nielsen. Further, applicant argues that the reference does not teach sialic acid concentration associated with mucin. However, it is very well known in the art that sialic acid is a component of mucin, and as such, the reference was merely relied upon for the teaching of the ability to detect sialic acid in saliva. One of skill in the art would have been supplied with the requisite motivation to quantify sialic acid as a component of mucin, instead of mucin altogether or some other component. In addition, since sialic acid is a component of mucin, the two are clearly "associated." Applicant's argument that Belce does not provide data demonstrating a definitive correlation between sialic acid and disease state is also unconvincing, as definitiveness is not the appropriate standard to be applied. The reference need only provide motivation for combination with a primary reference and teach the feature for which it was relied upon for it to form the basis of a proper 103 rejection, both of which the reference has done, for reasons as discussed above.

16. Applicant's arguments with respect to Astor are similarly unconvincing. While applicant may be correct in asserting that Xerostomia is not a caries disease, the specific diseases listed in the claims are not viewed as further limiting the method for reasons discussed above regarding

the "wherein" clause. However, assuming *arguendo* that applicant is correct, the reference need not teach the diagnosis of the disease itself, as applicant is claiming a method to diagnose ***or predict future development of disease***. Applicant admits that this condition is a risk factor for developing caries, which would clearly help in the prediction of future onset of caries disease.

17. Applicant argues that Astor has no teaching of a correlation between mucin concentration and risk of dental caries; however, the reference is not required to establish such a definite correlation. The combination of reference teach the positiveely recited steps of the method, namely (referring to independent claim 1), otbtaining a saliva sample, isolating a mucin, and quantitating a component associated with a mucin.

***Conclusion***

Claims 1, 3, 6-7, 10-11, 13-22, 72, 74, and 77-79 are rejected.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kartic Padmanabhan whose telephone number is 571-272-0825. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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*** KP

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05/03/04